



# UNITED STATES PATENT AND TRADEMARK OFFICE

mn  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,277	08/05/2003	David Alan Burton	SJO920020111US1	7126
45216	7590	06/04/2007	EXAMINER	
Kunzler & McKenzie			DARE, RYAN A	
8 EAST BROADWAY			ART UNIT	PAPER NUMBER
SUITE 600				2186
SALT LAKE CITY, UT 84111				
MAIL DATE		DELIVERY MODE		
06/04/2007		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/634,277	BURTON ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Ryan Dare	2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 18 April 2007.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,4-6,8,9,11-14,16,18-23,25,26 and 28 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1,4-6,8,9,11-14,16,18-23,25,26 and 28 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ .  | 6) <input type="checkbox"/> Other: _____ .                        |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 4-6, 8-9, 11-14, 16, 18-23, 25-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkowitz et al., US Patent 6,498,038, in view of

Kodama et al., US PG Pub, 2004/0254964, further in view of Shalit et al., US Patent 5,875,457, further in view of Armangau et al., US 6,934,822.

4. With respect to claim 1, Berkowitz et al. teach a computer program product comprising a computer useable medium having a computer readable program, wherein the computer readable program when executed on a computer causes the computer to: add snapshot criteria to a snapshot set stored in a metadata buffer, the snapshot criteria comprising a source volume indicator, a target volume indicator, a partial volume indicator, and a source extents indicator data, wherein the metadata buffer stores metadata for storage-based operations, in fig. 4, step 407 (AddComponents), col. 9, lines 58-61, and col. 8, lines 22-38, where it is disclosed that the backup components file contains the components that are to be backed up which includes where to find the data (source volume and extents). The backup components file of Berkowitz is the “metadata buffer” of the present claim; and

execute a plurality of fast replications operations comprising creating a snapshot set defined by metadata in the metadata buffer and deleting a specified snapshot set as specified by the snapshot set, in fig. 4, step 411 (DoSnapshotSet) and col. 10, lines 6-18, fig. 4, step 407 (StartSnapshotSet) and col. 9, lines 53-55, and in fig. 4, step 431 and col. 10, lines 10-12.

Berkowitz fails to teach an auto-select indicator. Kodama et al. teaches a replication system where the target volume can be selected either automatically or chosen by a user, thereby teaching an auto-select indicator, in par. 83.

Berkowitz and Kodama fail to teach a redundancy level indicator, the redundancy level indicator configured to select a redundancy in the range of no redundancy to a RAID level 50 redundancy. Shalit teaches this in col. 2, lines 41-51.

Berkowitz et al., Shalit et al. and Kodama et al. teach all other limitations of the parent claim, but fail to teach a background copy indicator field. Armangau et al. teach a background copy indicator in col. 16, lines 19-44.

5. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data replication system of Berkowitz et al. with the data replication system of Kodama et al. in order to automatically create virtual volumes in response to events being monitored in the data storage system, as taught by Kodama et al. in par. 83.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data replication system of Berkowitz et al. and Kodama et al. with the data replication system of Shalit in order to have a selectable redundancy level, which allows the user to select a RAID level, which accommodates cases where the number of storage elements for storing host data is variable, as taught by Shalit in col. 1, lines 23-32.

Further, it would be obvious to one of ordinary skill in the art at the time the invention was made, to modify the data replication system of Berkowitz et al., Shalit and Kodama et al. by performing the replication process in the background as taught by Armangau et al. in order to make efficient data replication, as taught by Armangau et al. in col. 15, lines 54-56.

6. With respect to claim 4, Berkowitz et al. teach the computer program product wherein the computer readable program is further configured to cause the computer to:

delete specified snapshot criteria from the snapshot set, in col. 10, lines 51-54;

and

terminate the plurality of fast replications operations specified by the snapshot set, in col. 10, lines 22-23.

7. With respect to claim 5, Berkowitz et al. teach the computer program product of claim 1, wherein the computer readable program is further configured to cause the computer to provide information regarding a specified snapshot set, in fig. 4, step 425 (GetDeviceObject) and in col. 10, lines 32-40.

8. With respect to claims 6, 8-9 and 11-12, Applicant claims an apparatus that corresponds to the computer readable storage medium of claims 1 and 4-5 and is therefore rejected using similar logic.

9. With respect to claim 13, Applicant claims an apparatus that contains the means for the apparatus of claim 6 and is therefore rejected using similar logic.

10. With respect to claim 14, Berkowitz et al. teach the apparatus of claim 13, further comprising:

means for managing a list of controllers associated with the snapshot set, in fig. 2, Providers 215, and described in col. 4, lines 11-52;  
means for creating the snapshot set, in fig. 4, step 407 (StartSnapshotSet) and col. 9, lines 53-55;

means for deleting a specified snapshot set, in fig. 4, step 431 and col. 10, lines 10-12;

means for removing specified snapshot criteria from the snapshot set, in col. 10, lines 51-54;

means for terminating the plurality of fast replications operations specified by the snapshot set, in col. 10, lines 22-23; and

means for providing information regarding a specified snapshot set, in fig. 4, step 425 (GetDeviceObject) and in col. 10, lines 32-40.

11. With respect to claim 16, Applicant claims the method that corresponds to the computer readable storage medium of claim 1, and is therefore rejected using similar logic.

12. With respect to claim 18, Berkowitz et al. teach the method of claim 16, further comprising conducting an operation selected from the group consisting of:

providing information regarding a specified snapshot set, in fig. 4, step 425 (GetDeviceObject) and in col. 10, lines 32-40;

deleting specified snapshot criteria from the snapshot set, in fig. 4, step 431 and col. 10, lines 10-12; and

terminating the plurality of fast replications operations specified by the snapshot set, in col. 10, lines 22-23.

13. With respect to claim 19, Berkowitz et al. teach the method of claim 18, wherein adding snapshot criteria to a snapshot set is conducted using an API, in col. 4, lines 2-5.

14. With respect to claim 20, Kodama et al. teach the method of claim 16, wherein adding snapshot criteria to a snapshot set and initiating a plurality of fast replication operations as specified by the snapshot set are conducted across multiple volumes and multiple controllers, in par. 89.
15. With respect to claim 21, Kodama et al. teach the method of claim 16, further comprising managing a list of controllers associated with the snapshot set, in par. 67.
16. With respect to claim 22, Berkowitz et al. teach the method of claim 16, further comprising managing a list of controllers associated with the snapshot set, in fig. 2, Providers 215, and described in col. 4, lines 11-52.
17. With respect to claim 23, Berkowitz et al. teach a system for managing and conducting fast replication operations, the system comprising:
  - a storage volume configured to store data, in fig. 2, backup media 230.
  - at least one storage controller configured to manage the storage volumes, in fig. 2, Providers 215, and described in col. 4, lines 11-52.
  - at least one storage controller further configured to add snapshot criteria to a snapshot set stored in a metadata buffer and execute a plurality of fast replications operations as specified by the snapshot set, wherein the metadata buffer stores metadata for storage-based operations, in fig. 2, Providers 215, and described in col. 4, lines 11-52. The backup components file of Berkowitz is the “metadata buffer” of the present claim; and
  - the at least one storage controller further configured to add snapshot criteria to add snapshot criteria to a snapshot set and execute a plurality of fast replications

Art Unit: 2186

operations as specified by the snapshot set, in fig. 4, step 411 (DoSnapshotSet) and col. 10, lines 6-18., the snapshot criteria comprising a source volume indicator, a target volume indicator, a partial volume indicator, and a source extents indicator data, in fig. 4, step 407 (AddComponents), col. 9, lines 58-61, and col. 8, lines 22-38, where it is disclosed that the backup components file contains the components that are to be backed up which includes where to find the data (source volume and extents); and

Berkowitz et al. fail to teach that the storage device can be a plurality of storage volumes. Kodama et al. teach that the backup storage device can be a plurality of storage volumes in par. 89.

Berkowitz and Kodama fail to teach a redundancy level indicator, the redundancy level indicator configured to select a redundancy in the range of no redundancy to a RAID level 50 redundancy. Shalit teaches this in col. 2, lines 41-51.

Berkowitz et al., Shalit and Kodama et al. fail to teach a background copy indicator field. Armangau et al. teach a background copy indicator in col. 16, lines 19-44.

18. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data replication system of Berkowitz et al. with the data replication system of Kodama et al. in order to automatically create virtual volumes in response to events being monitored in the data storage system, as taught by Kodama et al. in par. 83.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data replication system of Berkowitz et al. and

Kodama et al. with the data replication system of Shalit in order to have a selectable redundancy level, which allows the user to select a RAID level, which accommodates cases where the number of storage elements for storing host data is variable, as taught by Shalit in col. 1, lines 23-32.

Further, it would be obvious to one of ordinary skill in the art at the time the invention was made, to modify the data replication system of Berkowitz et al., Shalit and Kodama et al. by performing the replication process in the background as taught by Armangau et al. in order to make efficient data replication, as taught by Armangau et al. in col. 15, lines 54-56.

19. With respect to claim 25, Berkowitz et al. teach the system of claim 23, wherein the at least one storage controller is further configured to:

manage a list of controllers associated with the snapshot set, in fig. 2, Providers 215, and described in col. 4, lines 11-52;

remove specified snapshot criteria from the snapshot set, in col. 10, lines 51-54;

terminate the plurality of fast replications operations specified by the snapshot set, in col. 10, lines 22-23; and

provide information regarding a specified snapshot set, in fig. 4, step 425 (GetDeviceObject) and in col. 10, lines 32-40.

20. With respect to claim 26, Applicant claims a computer program product that is similar to claim 1 and is therefore rejected using similar logic.

21. With respect to claim 28, Berkowitz et al. teach the computer program product of claim 26, wherein the computer readable program is further configured to cause the computer to:

manage a list of controllers associated with the snapshot set, in fig. 2, Providers 215, and described in col. 4, lines 11-52;

remove specified snapshot criteria from the snapshot set, in col. 10, lines 51-54; terminate the plurality of fast replications operations specified by the snapshot set, in col. 10, lines 22-23; and

provide information regarding a specified snapshot set, in fig. 4, step 425 (GetDeviceObject) and in col. 10, lines 32-40.

### ***Response to Arguments***

22. Applicant's arguments filed 4/18/07 have been fully considered but they are not persuasive. With respect to claims 1, 6, 13, 23, and 26, Applicant argues that Lubbers fails to teach a redundancy level indicator. The Examiner is now using the Shalit reference to teach this limitation, as discussed above.

Further, Applicant argues that Armangau does not teach a background copy indicator. Applicant admits that Armangau does disclose a background copy routine, which is illustrated in fig. 26. As shown in block 235, the background copy routine runs while a particular bit is set. These bits can be considered a "background copy indicator." Applicant appears to be reading limitations from the specification into the

Art Unit: 2186

claim in order to say that this embodiment of Armangau does not meet the definition of “background copy indicator.”

Finally, Applicant claims that the cited references do not teach a metadata buffer. The Examiner believes that the backup components file in the Berkowitz reference may be considered the metadata buffer of the present claims. This is discussed in further detail in the rejection of the claims above.

### ***Conclusion***

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Dare whose telephone number is (571)272-4069. The examiner can normally be reached on Mon-Fri 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571)272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ryan A. Dare  
May 29, 2007



MATTHEW KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100